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AN APPLICATION OF THE SRS/RG IN DETERMINING ENLISTED ATTRITION —-ETC(U)

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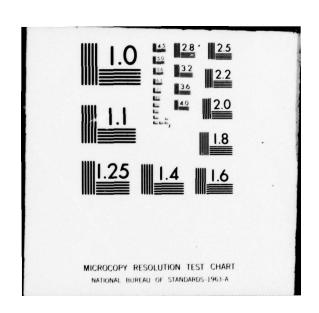
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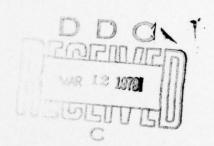
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Joseph M. D'Amalio Captain Walter W. Sevon, USMC

> Serial T-389 29 December 1978



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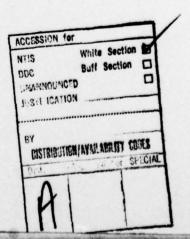
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The Statistical Retrieval System and Rate Generator (SRS/RG) is an automated data system that has been designed and programmed by the Program in Logistics staff of The George Washington University. The heart of the SRS/RG is a history file that covers the entire Marine Corps. This file is composed of variable length records and each record contains background information on one Marine. The purpose of this paper is to describe an application of the SRS/RG in determining average monthly attrition rates broken down by location, job, and grade. More generally, the SRS/RG can be used to determine essentially any kind of USMC personnel rate.



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1. Introduction

The Statistical Retrieval System and Rate Generator (SRS/RG) is an automated data system that has been designed and programmed by the Program in Logistics staff of The George Washington University. This system, installed on the computer at the Headquarters, United States Marine Corps (HQMC) is documented in [1], [2], [3], and [4]. The heart of the SRS/RG is a history file covering the entire Marine Corps; each record contains background information on one Marine. This file construction is unique among manpower data files at HQMC and provides data for analysis unavailable in the past.

Although the SRS/RG can be used to determine almost any personnel rate, the purpose of this paper is to describe its application in determining average monthly attrition rates. The SRS/RG Command Management Manual [3] will give the reader an indication of broader application of the SRS/RG.

A system has been designed to extract the appropriate information from the SRS/RG and compute the attrition rates. The attrition rates focus

¹ The program manual for this system may be found in [5].

on Marines leaving the Marine Corps prior to the completion of their first enlistment, namely non-End of Active Service (EAS) attrition. These rates are broken down by location, job, and grade, and are extremely important to the personnel managers at Headquarters Marine Corps responsible for the distribution of enlisted personnel. By having these attrition rates, personnel managers can project the number of personnel at major commands, by job and grade, which require replacement. This allows personnel managers to keep these major commands at constant strength levels. Further, loss rates generated through the SRS/RG similar to the rates described in this paper will be used in the Tour Optimization for Uniform Readiness (TOUR) Model [6]. These rates will allow the TOUR model to project assignments for personnel across the entire Marine Corps.

Prior to the creation of the SRS/RG it was virtually impossible to determine non-EAS attrition rates broken down by location, job, and grade. The Marine Corps Manpower Management System (MMS) is composed of many files which were not structurally designed in a manner suited to the extraction of this information. Headquarters Marine Corps (HQMC) maintains two main types of manpower data files. The first type is cross-sectional in nature to maintain current information on all active Marines. Files of the second type contain update transactions to a Marine's current status. None of these files contain, on a single record, longitudinal information to the extent of that in the SRS/RG and to get such information without the SRS/RG would require the matching of many files in HQMC. Such matching is a very time consuming process and is wasteful of computer resources. Further, when old files have been destroyed, certain information becomes virtually impossible to gather. The SRS/RG has been designed in order to be responsive to inquiries that require longitudinal data and to provide for the preservation of such data. Of course the SRS/RG is not intended to replace cross-sectional files; for example, it is more efficient to use the latter to gather current strength counts.

Population

Non-EAS attrition rates are computed for regular enlisted Marines in grades El to E5 who are on their first enlistment. A point in time is selected, called the <u>reference point</u>, and all records on the SRS/RG are examined to determine if the record designates an active Marine on first enlistment at the

reference point. Each record selected then corresponds to a Marine on active duty at the reference point. Once the reference point has been selected, each record is traced through a specific period of interest to determine if there was a non-EAS attrition. The attrition rates presented in Appendix A resulted from selecting a population with a reference point of October 1, 1977 and following the Marines for a period of interest of twelve months. Attrition rates have also been developed using other reference points tracing records from one to twelve months.

At the reference point, each record is examined and the appropriate location, job, and grade are extracted. The location is given in terms of thirteen distinct groups of Primary Monitor Command Codes (PMCC). These groups and their corresponding PMCC are presented in Appendix B. The jobs are in terms of Primary Military Occupational Specialties (PMOS) and the grades are broken into two levels. Level one consists of grades El through E3 and level two consists of grades E4 and E5. Once the PMOS and grade level have been examined at the reference point, they are not examined further. However, the location is traced throughout the period of interest.

Methodology

Once the population has been established, each record is examined to determine if there was non-EAS attrition, satisfactory completion of enlistment, or a transfer during the period of interest. With this information monthly non-EAS attrition rates are calculated as follows.

$$\rho = \frac{\sum_{i=1}^{n} x_i}{\sum_{i=1}^{n} y_i}$$

where $x_i = 1$ if record i shows non-EAS attrition during period of interest

= Ø if record i did not show such attrition

y, = the number of months that record i remained at the specific location

n = number of records with unique combinations of PMOS, grade level, and location

TABLE 1

EXTRACTS OF AVERAGE MONTHLY NON-EAS ATTRITION RATES FROM APPENDIX A

Location	PMOS	Grade Level	Percent Attrition	N
West Coast FMF	0311	1	2.00	2241
	0311	2	.28	1160
	0811	1	1.68	276
	0811	2	.69	96
	2531	1	1.35	802
	2531	2	.29	377
East Coast FMF	0311	1	1.99	3200
	0311	2	.29	1191
	0811	1	1.34	412
	0811	2	.25	167
	2531	1	1.25	982
	2531	2	.12	524
Far East FMF	0311	1	.91	2432
	0311	2	.05	564
	0811	1	.52	311
	0811	2	0	121
	2531	1	.69	998
	2531	2	.12	247

The ratio ρ is calculated for each unique combination of PMOS, grade level, and location. In the calculation, location is the only variable monitored throughout; the PMOS and grade level are examined only at reference point and at no other time in the period of interest. Therefore, it is possible for an individual to change his PMOS or his grade level but still be counted at his previous PMOS and grade level. This problem can be minimized by choosing a very short period of interest. Ideally, the program would be run for twelve consecutive months with a period of interest of one month each. However, with two grade levels, thirteen location groups, and approximately 300 PMOS's, there would be approximately 7,800 attrition rates per run. It would obviously be unmanageable to review twelve monthly sets of attrition rates. However, personnel managers are quite capable of reviewing four quarterly sets of rates and such sets for a complete year could also give an indication of seasonality.

When it is determined that a Marine satisfactorily completed his enlistment during the period of interest, the record is treated as a transfer. Therefore, the Σ y would be equal to the number of months prior to the completion of enlistment, and the subsequent transfer out of the PMCC.

The Separation Codes which appear in Appendix C were used to determine if there was non-EAS attrition, separation for immediate reenlistment, or EAS-attrition.

Results

The average monthly attrition rates for Fiscal Year 1978 are provided in Appendix A. Extracts of these rates are presented in Table 1. The PMOS's presented, 0311, 0811, and 2531, correspond to rifleman, field artillery batteryman, and field radio operator respectively. Note the similarity in attrition rates between the West Coast FMF and the East Coast FMF. As one might expect, the attrition rate of personnel in grades level two, E4's and E5's, is substantially lower than that of grade level one, the E1's through E3's. However, certain dis-similarities are apparent. There appears to be a significant difference in the average monthly rates between the continental United States attrition rates and those of the Far East FMF. Further, there appears to be a significant difference in attrition rates for different PMOS's. This information is extremely useful. When modeling the manpower flows or in

distributing personnel these differences must be taken into account. Likewise, it may be possible to aggregate the East Coast and West Coast together for modeling or assignment purposes and this reduces the number of variables to be considered.

Conclusion

The SRS/RG has proven to be an extremely useful file in providing attrition rates and many other types of information to HQMC. Because of the design of the SRS/RG--a variable length record with historical information on one Marine per record--the file has been more responsive to certain needs of users in HQMC, and more efficient in usage of computer resources, than conventional Manpower data files. The particular application of the SRS/RG in this report, calculating average monthly non-EAS attrition rates, has been useful to HQMC personnel managers and it takes the place of substantial manual effort previously used to estimate these rates.

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Appendix A

FY 78 AVERAGE MONTHLY NON-EAS ATTRITION RATES BY MCC-CODE, MOS, SKILL

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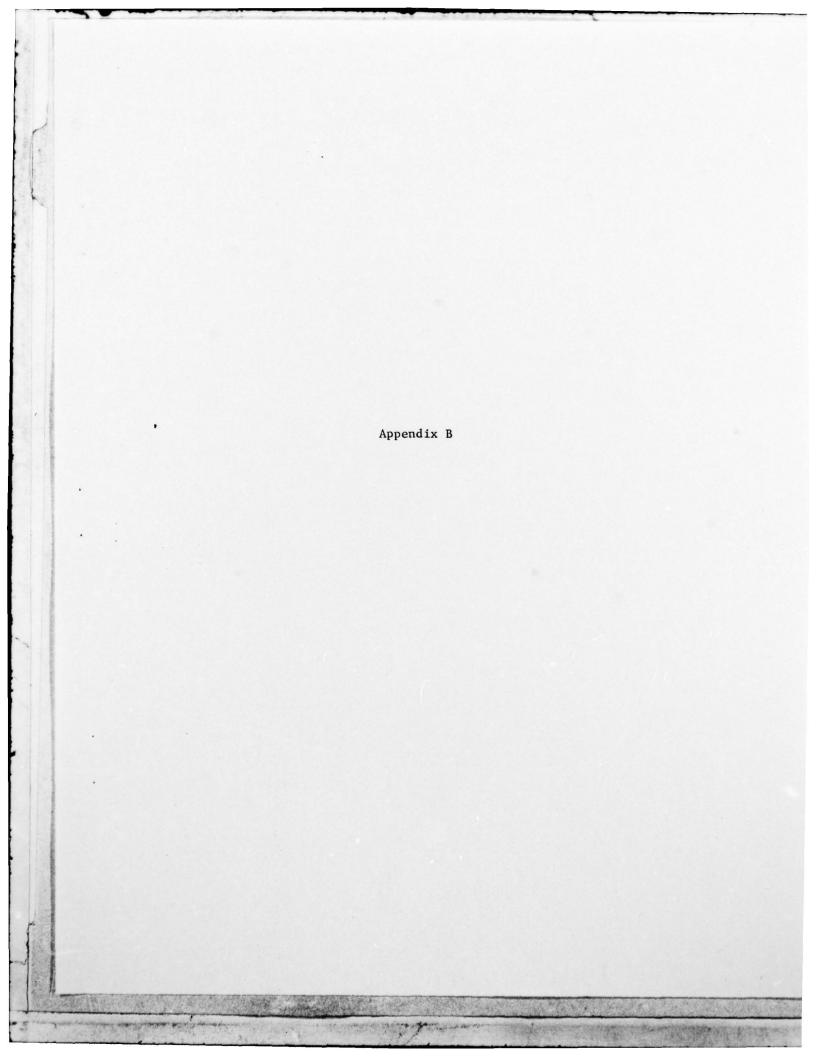
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Appendix B

MCC CODE	DESCRIPTION		1	ACTUAL	MCCS	5	
00	USMC Recruit Depots	016,	017				
01	Hawaii	130,	436,	442,	1CD,	091,	1C1
02	West Coast Fleet Marine Force (FMF) Units	121, 1D4	143,	144,	164,	169,	1D0
03	East Coast Fleet Marine Force Units	122, 1D3,		151,	160,	165,	101,
04	Far East FMF Units				044, 1D2,		
05	Marine Barracks in United States	226, 240,	229, 251,	230, 254,	217, 233, 256, 274,	234, 262,	237,
06	Overseas Marine Barracks	314,		316,	365, 317,		
07	Overseas Marine Barracks	351,	312,	333			
08	Marines on Sea Duty				431, 444,		
09	Force Troops, FMF PAC	150,	1DJ				
10	Security Guard Detachments	RDO,	RO2,	R06,	RO8,	RLO,	R14
11	Non-FMF Units	019, 027, 040,	022, 028,	023, 029, 047,	012, 024, 030, 048, 063	025,	026,
12	All Others	ALL (OTHER				

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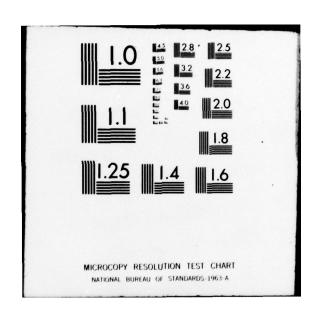






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Appendix C

Appendix C

NON-EAS SEPARATION CODES

HNC

THRU

JKA THRU JNC
H20 THRU H67
820 THRU 899

GFN, JCM, JDF, JDJ, JDK, JFB, JFC, JFF, JFG, JFK, JFL,
JFM, JFN, JFP, JFR, JFT, JFV, JHF, JJB, JJC, JJD, JMF,
JNF, JPB, KCM, KCQ, KDB, KDC, KDF, KDG, KDH, KFF, KFS,
KFV, KNL, LFG, MCK, MDB, MDH, MND, RFJ, RFK, SFJ, SFK,
VFJ, VFK, WFK, YND

IMMEDIATE REENLISTMENT SEPARATION CODES

KHC

GKA

EAS SEPARATION CODES

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NARDAC Tech Library

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Integrated Sea Lift Study

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